

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 05 SEP 2005

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Applicant's or agent's file reference 100452	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. CT/SG2004/000122	International filing date (day/month/year) 6 May 2004	Priority date (day/month/year) 29 September 2003
International Patent Classification (IPC) or national classification and IPC Int. Cl. <sup>7</sup> G06F 17/14		
Applicant AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
- a. ☐ (sent to the applicant and to the International Bureau) a total of      sheets, as follows:
- ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
- ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s))      , containing a sequence listing and/or table related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:
- |                                     |              |   |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the report   |
| <input type="checkbox"/>            | Box No. II   | Priority  |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention.   |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited   |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application  |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application   |

Date of submission of the demand 29 July 2005	Date of completion of the report 23 August 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  BEN TUOHY Telephone No. (02) 6283 7918

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SG2004/000122

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This report is based on translations from the original language into the following language which is the language of a translation furnished for the purposes of:
    - ☐ international search (under Rules 12.3 and 23.1 (b))
    - ☐ publication of the international application (under Rule 12.4)
    - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
  - ☒ the international application as originally filed/furnished
  - ☐ the description:
 

pages	as originally filed/furnished	
pages*	received by this Authority on	with the letter of
pages*	received by this Authority on	with the letter of
  - ☐ the claims:
 

pages	as originally filed/furnished	
pages*	as amended (together with any statement) under Article 19	
pages*	received by this Authority on	with the letter of
pages*	received by this Authority on	with the letter of
  - ☐ the drawings:
 

pages	as originally filed/furnished	
pages*	received by this Authority on	with the letter of
pages*	received by this Authority on	with the letter of
  - ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
  - ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to the sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to the sequence listing (*specify*):

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SG2004/000122

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## Statement

Novelty (N)	Claims 1 - 11	YES
	Claims None	NO
Inventive step (IS)	Claims 1 - 11	YES
	Claims None	NO
Industrial applicability (IA)	Claims 1 - 11	YES
	Claims None	NO

## Citations and explanations (Rule 70.7)

### Documents cited for the purpose of compiling this report:

- (D1) US 2003/0014136 A1 (WANG et al.) 16 January 2003;  
 (D2) DARLINGTON D. et al., DIGITAL AUDIO EFFECTS IN THE WAVELET DOMAIN [online], Proc. Of the 5<sup>th</sup> Int. Conference on Digital Audio Effects (DAFX-02), Hamburg, Germany, September 26-28 2002, [Retrieved on 7 June 2004]. Retrieved from The Internet: <URL: [http://www.unibw-hamburg.de/EWEB/ANT/dafx2002/papers/DAFX02\\_Darlington\\_Daudet\\_Sandler\\_wavelet.pdf](http://www.unibw-hamburg.de/EWEB/ANT/dafx2002/papers/DAFX02_Darlington_Daudet_Sandler_wavelet.pdf)>;  
 (D3) US 2002/0012470 A1 (LUNA et al.) 31 January 2002;  
 (D4) WO 2000/055757 A1 (THE JOHNS HOPKINS UNIVERSITY) 21 September 2000;  
 (D5) US 5999656 A (ZANDI et al.) 7 December 1999;  
 (D6) GB 2325368 A (RICOH CO., LTD.) 18 November 1998; and  
 (D7) US 5523847 A (FEIG et al.) 4 June 1996.

### NOVELTY (N) and INVENTIVE STEP (IS) claims 1 - 11

The invention defined in claims 1 - 11 is novel and contains an inventive step in light of documents D1 - D7. The documents cited in the associated International Search Report, documents D1 - D7, do not clearly disclose a process for determining a transforming element for a given transformation function, which transformation function comprises a transformation matrix and corresponds to a transformation of a digital signal from the time domain into the frequency domain or vice versa, wherein:

The transformation matrix is decomposed into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

The rotation matrix and the auxiliary matrix are each decomposed into a plurality of lifting matrices; and

The transforming element is determined to comprise of a plurality of lifting stages which correspond to the lifting matrices.

### INDUSTRIAL APPLICABILITY (IA)

The claimed invention finds use in the field of digital signal transformation and clearly meets the requirements of industrial applicability

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